

Title: Student Entrepreneurs

Brief Overview:

Your class is considering opening a school store from which students can buy school supplies. Students will collect, analyze, and interpret data in a variety of formats to determine the feasibility of this enterprise. This real-life unit actively involves students in the decision making process, using problem solving, reasoning, and communication. Connections to other curriculum areas are integrated throughout.

Links to Standards:

- **Mathematics as Problem Solving**

Students will demonstrate their ability to solve problems in mathematics including problems with open-ended answers, problems which are solved in a cooperative atmosphere, and problems which are solved with the use of technology.

- **Mathematics as Communication**

Students will demonstrate their ability to communicate mathematically. They will read, write, and discuss mathematics with language and the signs, symbols, and terms of the discipline.

- **Mathematics as Reasoning**

Students will demonstrate their ability to reason mathematically. They will make conjectures, gather evidence, and build arguments.

- **Mathematical Connections**

Students will demonstrate their ability to connect mathematics topics within the discipline and with other disciplines.

- **Number Sense & Operations**

Students will demonstrate their ability to describe and apply number relationships using concrete and abstract materials. They will choose appropriate operations and describe effects of operations on numbers.

- **Measurement**

Students will demonstrate and apply concepts of measurement using non-standard and standard units and metric and customary units. They will estimate and verify measurements. They will apply measurement to interdisciplinary and real-world problem-solving situations.

- **Statistics**

Students will demonstrate their ability to collect, organize, and display data and will interpret information obtained from displays. They will write reports based on statistical information.

- **Probability**

Students will demonstrate the basic concepts of probability such as predicting and finding probabilities.

- **Patterns & Relationships**

Students will demonstrate their ability to recognize numeric and geometric relationships and will generalize a relationship from data.

- **Fractions & Decimals**

Students will demonstrate and apply concepts of fractions, mixed numbers, and decimals; use models to relate fractions to decimals and to find equivalent fractions; compute with whole numbers, fractions, and decimals; and apply fractions and decimals to problem situations.

Grade/Level:

Grades 2-5

Length/Duration:

Eight 45-minute periods

Prerequisite Knowledge:

Students should have working knowledge of the following skills (for example):

- Constructing and interpreting bar graphs, glyphs and charts
- Multiplication (Calculator may be used)
- Adding and subtracting money
- Writing a persuasive letter, parts of a business letter
- Complete a tally chart
- Use a centimeter ruler to measure lines

Objectives:

Students will :

- collect, organize, display, and interpret data in a variety of formats.
- identify the reasons why people start businesses.
- construct and interpret a bar graph.
- construct and interpret a glyph.
- make predictions and explain them.
- complete a table.
- use a calculator to multiply money and determine costs.
- identify the mode in a set of data.
- compare predictions to survey results in writing.
- distinguish between consumable and non-consumable items.
- use rubrics and scoring keys to evaluate their own and others' work.
- complete a survey.
- work cooperatively to solve problems.
- write for a variety of purposes.
- measure lines using a centimeter ruler.

Materials/Resources/Printed Materials:

- Resource Sheets, Rubrics, and Scoring Keys
- Calculators, Centimeter Rulers, Post-it Notes, Crayons or Markers
- How the Second Grade Got \$8,205.50 to Visit the Statue of Liberty, by Nathan Zimelman

Development/Procedures:

Day 1: Introduction

1. Teacher will begin a discussion by asking students if they know any children who have started their own business. What do you think their reasons were for starting the business? How do you think they got started? Make sure to include some discussion about the concept of working hard to achieve a goal. (Children can discuss these questions in pairs before sharing with class.)

2. Teacher reads aloud How the Second Grade Got \$8,205.50 to Visit the Statue of Liberty by Nathan Zimelman. Teacher leads a discussion about this story and the effort needed to accomplish the students' goal.

3. Problem: Our class wants to raise money by opening a school store that will sell school supplies. We need to gather information that will help us persuade the school principal that this would be a good idea and convince him or her to provide us with the money to get started.

Homework: Think about a use for the money we make from this school store. Write a paragraph about your idea and why you think it is a good one.

Day 2: Gathering Data

1. Students will complete the School Store Survey Sheet (Resource Sheet 1). Teacher should review directions with students before asking them to complete this independently.

2. Teacher will display the data from Resource Sheet 1 as a class bar graph (See Resource Sheet 2). This graph will be completed as part of Day 3. However, it should be introduced on Day 2 so that students can complete the following prediction activity.

3. Students will take their prediction from the Survey Sheet and use sticky notes to place them underneath the item name on the class graph. This graph will remain in place until the unit is complete.

4. Teacher will form cooperative learning groups of 3 or 4 students. Students will use the Group Tally Chart (Resource Sheet 3) to consolidate their individual results. Only items for which there are one or more votes should be included. All work should be collected to be used the following day.

Day 3: Organizing and Interpreting Data

1. A reporter from each group will inform the teacher of the number of votes for each item on their group's tally chart. Teacher will create a bar graph using this data.

2. Teacher will lead a class discussion about the results of the survey and about the trends indicated by the graph. The mode (the item with the most votes) should be identified. Students should identify items that received few or no votes and discuss possible reasons for this in their cooperative groups. Reasons for items receiving many votes should also be discussed.

3. Students will be asked to write a paragraph to compare their prediction of the item which would be most popular with the actual results. They should be asked to explain why they made their initial choice and how it compares with the class' choice.

Day 4: Displaying Data

1. A rubric for a bar graph has been provided (Resource Sheet 4) and should be prominently displayed for students to refer to as they work.
2. Students should determine and list the ten top items from the class bar graph on Resource Sheet 5 without teacher direction. They will be asked to construct an individual bar graph using this data.
3. Students will work in pairs to discuss their partner's graph based on the rubric. Students should be given the opportunity to revise their graphs as needed before handing them in.

Day 5: Displaying and Interpreting Information Using a Glyph

1. Students will work in their cooperative groups to complete this activity. Teacher will distribute Resource Sheet 6 (Weekly Sales Glyph). This type of glyph is called a Circle and Ray Glyph. Teacher will lead a discussion about this type of glyph and will point out the key, emphasizing the scale (1 cm = 5 items). Teacher should discuss the method students will use to calculate the number of items sold in a week, as well as the terms "consumable" and "non-consumable" as they apply to the items on the glyph.
2. Students will use the key to color code the items as consumable or non-consumable on the Weekly Glyph.
3. Students will use the key and a centimeter ruler to measure the rays and record the measurement on the chart. They will use this data to determine the number of each item sold during a week. They should record that information on the chart.
4. Students should discuss how many of each item might be sold in a month based on the weekly glyph. Teacher should record these figures on the board to be used the following day.
5. Each student will then write a paragraph explaining the conclusions they drew about monthly sales as compared to weekly sales.

Day 6: Computation Using a Chart

1. Students will work in cooperative groups to complete this activity. Each student will complete his/her own work sheet.
2. Teacher will distribute Resource Sheets 7 and 8 (Monthly Sales Glyph and Cost Chart). Students will construct the rays on their glyph, based on the previous day's discussion. They will list the items on the Cost Chart, then record the number of items sold in a month. Using this data and the cost indicated for each item, students will calculate the cost for each of the ten school store items and record this on the chart. They will need to total the costs of all ten items to find a grand total.
3. Once a total has been calculated (and reviewed as a class), a discussion about budgets and how stores use them to plan their merchandise orders should be conducted.

Day 7: Writing a Rough Draft of a Persuasive Letter

1. In order to start our School Store, we need to convince the principal of the need for the store and our reasons for wanting to open one. We must let the principal know how much money we will require to purchase inventory (define inventory if students are unfamiliar with the term) and what we plan to do with any profits earned. Today you will begin to write a letter to the principal to request his/her assistance in opening a school store.
2. Teacher will review their school's criteria for Writing to Persuade and Writing a Business Letter. The teacher will return homework assignment from Day 1 to students.
3. Students will work independently to brainstorm reasons for opening a School Store. They will also list possible uses for profits by referring to their homework paragraphs. This can be recorded using a graphic organizer or list.
4. Students will use their prewriting to complete a rough draft of a letter to the principal.

Day 8: Revision, Editing, and Final Copy

1. Students will exchange their letters with a partner and complete the Peer Response Sheet (Resource Sheet 9).
2. After reviewing the response sheet together, they will use an editing checklist to complete the editing and revision process. This checklist will be teacher provided according to their school or district standards.
3. Students will complete their final copy. Teacher will score letters based on a Writing to Persuade rubric and correct business letter format.

Performance Assessment:

Students can be assessed during the unit's activities in a variety of ways. There are both formal and informal assessment tools provided. The teacher will need to provide his/her school district/county guidelines for the following: Writing to Persuade, Business Letter format, Language Usage, and Editing and Revision Checklists. Included with this unit is a rubric for a bar graph, and a peer response sheet for the writing prompt. There are open-ended written response activities, cooperative learning activities, and individual and group products which students will create.

Extension/Follow Up:

1. Pool results of survey from several classes (or school-wide) and graph total results. Use to analyze similarities and differences from class graphs.
2. Determine potential profits based on cost vs. selling price. Use as an introduction to the basics of markup.
3. Write a plan for starting a business, including staffing, scheduling, purchase ordering, money management, budgeting and facilities management.
4. Use catalogs to compare cost of items and choose the more cost-effective supplier for the store. Students could construct a double bar graph to compare the data.

5. Literature Connections:

Millie Willenheimer and the Chestnut Corporation by Dean Hughes (Grades 5-7)

Eddie, Incorporated by Phyllis Naylor (Grades 4-6)

Pig, Pig Gets a Job by David McPhail (Picture Book)

Lily and Miss Liberty by Carla Stevens (Grades 2-5)

The Bathwater Gang Gets Down to Business by Jerry Spinelli (Grades 2-4)

The Turtle Street Trading Company by Jill Ross Klein (Grades 4-6)

Turtles Together Forever by Jill Ross Klein (Grades 4-6)

Project Wheels by Jacqueline Banks (Grades 2-4)

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SCHOOL STORE SURVEY SHEET

Directions:

Place a check mark beside the ten items you would want most to be sold at the school store. For numbers 19 and 20, add two more items that you feel should be included on this list. Then mark with an asterisk (*) the one item that you think will receive the greatest number of votes.

- | | |
|------------------------|-------|
| 1. Pencils | _____ |
| 2. Erasers | _____ |
| 3. Folders | _____ |
| 4. Marble Notebooks | _____ |
| 5. Rulers | _____ |
| 6. Loose-leaf Paper | _____ |
| 7. Memo Pads | _____ |
| 8. Pencil Boxes | _____ |
| 9. Pencil Sharpeners | _____ |
| 10. Loose-leaf Binders | _____ |
| 11. Spiral Notebooks | _____ |
| 12. Pens | _____ |
| 13. Markers | _____ |
| 14. Crayons | _____ |
| 15. Glue | _____ |
| 16. Scissors | _____ |
| 17. Highlighters | _____ |
| 18. Pencil Grips | _____ |
| 19. _____ | _____ |
| 20. _____ | _____ |

Write a sentence explaining why you made the prediction that you did. _____

CLASS GRAPH OF SURVEY RESULTS

Resource Sheet 2

Number of Votes from Group Tallies

PENCILS

ERASERS

FOLDERS

**MARBLE
NOTEBOOKS**

RULERS

**LOOSE-LEAF
PAPER**

MEMO PADS

**PENCIL
BOXES**

**PENCIL
SHARPENERS**

**LOOSE-LEAF
BINDERS**

**SPIRAL
NOTEBOOKS**

PENS

MARKERS

CRAYONS

GLUE

SCISSORS

HIGHLIGHTERS

PENCIL GRIPS

OTHER

Resource Sheet 3

GROUP TALLY SHEET

Directions: In your groups, make a tally chart for the total number of votes for each item. Include items that you added at the bottom of the chart.

[illegible]

BAR GRAPH RUBRIC

4 POINTS

All information is included and is accurate.
An appropriate title has been included.
Both axes are labeled correctly and have a title.
Appropriate scale is used.
There is a space between each bar.
Graph is neat, well organized, and attractive.
Top ten items are accurately listed on Resource Sheet 5.
Work is completed with minimum teacher direction.

3 POINTS

At least 6 of the above criteria have been met.

2 POINTS

At least 4 of the above criteria have been met.

1 POINT

Fewer than 4 of the above criteria have been met.

Resource Sheet 5

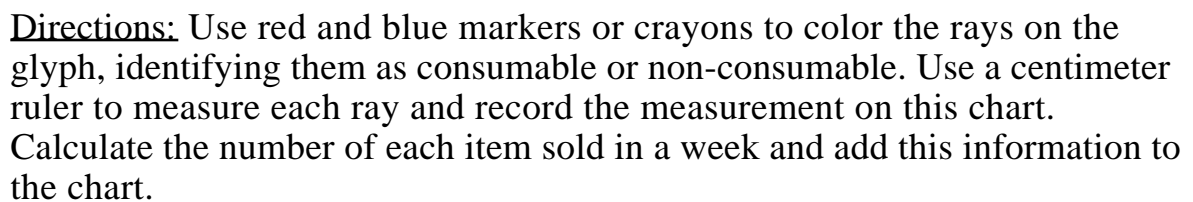
LIST OF 10 MOST POPULAR ITEMS

Directions: Using the line plot that the class created, list the ten items that received the most votes on the lines below. Also, write the number of votes each of the items received. You will then use this information to create a bar graph.

Name of Item

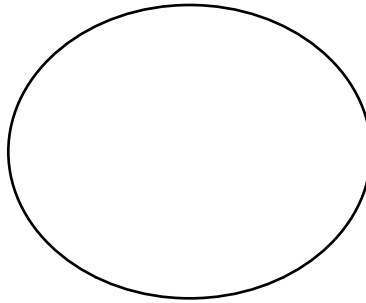
Number of Votes

WEEKLY SALES GLYPH

[illegible]

MONTHLY SALES GLYPH

Directions: Construct a glyph using the data from the board, showing the number of each item that was sold in a month. Your teacher will help you to decide on a scale depending on the number of items you have predicted will be sold in a month.



KEY

CONSUMABLE=RED

NONCONSUMABLE=BLUE

_____CM=_____ITEMS

COST CHART

Directions: Measure each ray on the Monthly Sales Glyph on Resource Sheet 6. Use the key to obtain the number of each item sold. Record this information on the chart below. Then, use the unit cost to calculate the total cost for each item. After you have completed these calculations, find the grand total of all ten items so that you can request this amount from your principal.

NAME OF ITEM	NUMBER SOLD IN A MONTH	UNIT COST	TOTAL COST

GRAND TOTAL: _____

PEER RESPONSE SHEET
FOR A PERSUASIVE LETTER

YOUR NAME _____

PARTNER'S NAME _____

DATE _____

1. Did the author provide at least three adequate reasons for opening a school store? _____
2. Did the author explain to the principal why a school store is needed? _____
3. Is the amount of money that will be required included in the letter? _____
4. Did the author explain how the money earned by the school store would be used? _____
5. Did the author use correct business letter format? _____
6. Make at least one suggestion that the author could use to improve his/her letter on the lines below.
